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## CLAIMS

13. An optical wave guide having at least one plastic optical fiber comprising a plastic optical fiber core, a fluorine-containing fiber cladding and a protective sheath self-adhesively applied to said at least one plastic optical fiber, wherein said protective sheath comprising <sup>er</sup> polymeric compounds selected from the group consisting of polyamides, copolyamides and mixtures thereof ~~having~~ having a melting point less than 220°C, a concentration of amino terminal groups between 50 and 300  $\mu\text{eq/g}$  and a maximum concentration of carboxyl terminal groups no greater than 15  $\mu\text{eq/g}$ .

14. An optical wave guide according to claim 13 wherein said polymeric compounds have a melting point less than 210°C.

15. An optical wave-guide according to claim 13 wherein said polyamides are selected from the group consisting of PA 11, PA 12, PA 610, PA 612 and PA 1212.

16. An optical wave-guide according to claim 13 wherein said copolyamides are selected from the group consisting of PA 6/12, PA 6/9/6, PA 6/9/12, PA 610/6, PA 610/11, PA 610/12, PA 612/6, PA 612/11, PA 612/12 and mixtures thereof.

17. An optical wave guide according to claim 13 wherein at least one polyamide, copolyamide, or mixture comprises PA 12.

18. An optical wave-guide according to claim 15 wherein the concentration of amino terminal groups is between 90 and 250  $\mu\text{eq/g}$ .

19. An optical wave-guide according to claim 13 wherein said protective sheath further comprises at least one additive selected from the group consisting of UV stabilizers, heat stabilizers, crystallization promoters, softeners, flame retardants, external lubricants and inorganic fillers.

20. An optical wave-guide according to claim 13 wherein said plastic fiber core is formed from polymethylmethacrylate.

21. An optical wave-guide according to claim 13 wherein said plastic optical fiber has an outer diameter of between approximately 75 and approximately 3000  $\mu\text{m}$ .

22. An optical wave-guide according to claim 13 wherein the thickness of the fluorine-containing fiber cladding is between 5 and 10  $\mu\text{m}$ .

23. A protective sheath for an optical wave guide having at least one plastic optical fiber comprising a plastic optical fiber core and a fluorine-containing fiber cladding, said sheath comprising polymeric compounds selected from the group consisting of polyamides,

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copolyamides and mixtures thereof having a melting point less than 220°C a concentration of amino terminal groups between 50 and 300  $\mu\text{eq/g}$  and a maximum concentration of carboxyl terminal groups no greater than 15  $\mu\text{eq/g}$ .

24. A protective sheath according to claim 23 wherein said polymeric compounds have a melting point less than 210°C.
25. A protective sheath according to claim 23 wherein said polyamides are selected from the group consisting of PA 11, PA 12, PA 610, PA 612 and PA 1212.
26. A protective sheath according to claim 23 wherein said copolyamides are selected from the group consisting of PA 6/12, PA 6/9/6, PA 6/9/12, PA 610/6, PA 610/11, PA 610/12, PA 612/6, PA 612/11, PA 612/12 and mixtures thereof.
27. A protective sheath according to claim 23 wherein at least one polyamide, copolyamide or mixture comprises PA 12.
28. A protective sheath according to claim 23 wherein the concentration of amino terminal groups is between 90 and 250  $\mu\text{eq/g}$ .
29. A protective sheath according to claim 23 wherein said protective sheath further comprises at least one additive selected from the group consisting of UV stabilizers, heat stabilizers, crystallization promoters, softeners, flame retardants, external lubricants and inorganic fillers.